

**We Claim:**

1. A wireless local loop system for carrying at least one subscriber service between a network and a subscriber terminal via a wireless link, said system comprising:

5           at least one base station interconnecting said network and said wireless link, said base station operable to transceive said service over said link; and

10           a subscriber station interconnecting said subscriber terminal and said wireless link, said subscriber station being connected to a steerable antenna that is mounted externally to said subscriber station and is operable to be oriented in a direction having a desired transception-quality of said service over said link.

- 15           2. The wireless local loop system of claim 1 wherein said subscriber service includes a voice service, said subscriber terminal is a voice terminal and said network includes the public switched telephone network.

- 20           3. The wireless local loop system of claim 1 wherein said subscriber service includes a data service, said subscriber terminal is a data terminal and said network includes the internet.

4. The wireless local loop system of claim 1 wherein said wireless link is based on CDMA.

- 25           5. The wireless local loop system of claim 1 wherein said steerable antenna is electrically steerable.

- 30           6. The wireless local loop system of claim 5 wherein said steerable antenna includes a plurality of directional antennas each defining a different sector of coverage for said antenna, each of said directional antennas being switchable in relation to each other such that said antenna transceives said radio link in said direction.

7. The wireless local loop system of claim 6 wherein said steerable antenna includes four of said directional antennas at an angle of ninety degrees to the other, and each of said directional antennas having a coupled patch configuration.

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8. The wireless local loop system of claim 7 wherein said coupled patch configuration includes a plurality of sub-elements.

9. The wireless local loop system of claim 1 wherein said subscriber service is fixed within said subscriber's premises.

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10. The wireless local system of claim 1 wherein said tranception-quality is measured using at least one of the metrics of signal-to-noise ratio, bit error rate, frame error rate, bit rate, power level and frame rate of said link.

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11. The wireless local loop system of claim 1 wherein said desired tranception-quality is based on an orientation of said antenna requiring a lowest emitted power level from said antenna.

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12. The wireless local loop system of claim 6 wherein one of said directional antennas is selectively used for an uplink portion of said link and another of said directional antennas is selectively used for a downlink portion of said link, each of said directional antennas being selected according to a desired transmission-quality of said uplink and a desired reception-quality of said downlink.

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13. The wireless local loop system of claim 1 wherein said subscriber station includes at least one steerable antenna orientable in both horizontal and vertical planes.

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14. The wireless local loop system of claim 6 wherein each of said sub-elements includes a substantially octagonal outer-patch and a substantially octoganal inner-patch, said outer patch serving as a parasitic element to its said

respective inner patch.

15. A method of orienting a steerable antenna connected to a wireless local loop subscriber station, comprising the steps of:

- a. determining an appropriate time to orient said antenna;
- b. illuminating said steerable antenna in a given orientation and measuring a transception-quality of a wireless link in said given orientation;
- c. repeating said illuminating step until a desired number of orientations have been illuminated; and,
- d. orienting said antenna towards the one said orientation that has a desired transception-quality for a subscriber service transmitted over said link.

16. The method according to claim 15 wherein each said orientation is a sector of a circle.

17. The method according to claim 15 wherein said desired number of orientations is the entire number of orientations in which said steerable antenna can be oriented.

18. The method according to claim 15 wherein said appropriate time is reached if said subscriber station is initializing communication over said wireless link between said subscriber station and a base station.

19. The method according to claim 15 wherein said appropriate time is determined based on a type of service being carried over said link.

20. The method according to claim 19 wherein said appropriate time is reached if said service is a data service that is latency tolerant.

21. The method according to claim 18 wherein said appropriate time is reached if

said subscriber station is in an idle state.

22. The method according to claim 15 wherein said tranception-quality is measured with at least one of the metrics of signal-to-noise ratio, bit error rate, frame error rate, bit rate, power level and frame rate of said link.

23. The method according to claim 15 wherein said link is based on CDMA and said desired tranception-quality is based on the one of said orientations requiring the least emitted power level from said subscriber station.

24. A subscriber station for a wireless local loop system that carries at least one subscriber service between a network and a subscriber terminal, said system including at least one base station interconnecting said network and a wireless link, said base station operable to transceive said service over said link, said subscriber station comprising:

a microprocessor-assembly interconnecting said subscriber terminal and a modem, said microprocessor-assembly for processing said subscriber service, said modem for modulating and demodulating said service,

a radio connected to said modem and for converting said service for tranception over said wireless link; and,

a connection means for attaching a steerable antenna to said radio, said steerable antenna operable to be oriented in a direction that achieves a desired tranception-quality of said service over said link.

25. The subscriber station of claim 24 wherein said subscriber service includes a voice service, said subscriber terminal is a voice terminal and said network includes the public switched telephone network.

26. The subscriber station of claim 24 wherein said subscriber service includes a data service, said subscriber terminal is a data terminal and said network includes the internet.

27. The subscriber station of claim 24 wherein said wireless link is based on

CDMA.

28. The subscriber station of claim 24 wherein said steerable antenna is electrically steerable.

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29. An antenna for a wireless local loop subscriber station comprising:  
a connecting means for attaching said antenna to a radio of said subscriber station;  
a plurality of directional antennas each defining a different sector of coverage for said antenna, each of said directional antennas being switchable in relation to each other such that said antenna transceives a radio link in said direction.

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30. The antenna of claim 29 wherein said steerable antenna includes four of said directional antennas at an angle of ninety degrees to the other, and each of said directional antennas having a coupled patch configuration.

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31. The antenna of claim 30 wherein said coupled patch configuration includes a plurality of sub-elements.

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32. The antenna of claim 29 wherein said desired transception-quality is based on an orientation of said antenna requiring a lowest emitted power level from said antenna.

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33. The antenna of claim 30 wherein one of said directional antennas is selectively used for an uplink portion of said link and another of said directional antennas is selectively used for a downlink portion of said link, each of said directional antennas being selected according to a desired transmission-quality of said uplink and a desired reception-quality of said downlink.

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34. The antenna of claim 30 wherein said subscriber station includes at least one steerable antenna orientable in both horizontal and vertical planes.

35. The antenna of claim 30 wherein said each of said sub-elements includes a substantially octagonal outer-patch and a substantially octoganal inner-patch, said outer patch serving as a parasitic element to its said respective inner patch.

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36. The antenna according to claim 29 wherein said subscriber service includes a voice service and said subscriber terminal is a voice terminal.

37. The antenna according to claim 29 wherein said subscriber service includes a data service and said subscriber terminal is a data terminal.

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38. The antenna according to claim 29 wherein said wireless link is based on CDMA.

39. A kit of parts for an antenna for a wireless local loop subscriber station, said kit comprising comprising:

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an externally mountable steerable antenna portion;

a connecting means for interconnecting said antenna to a radio of said subscriber station;

mounting hardware complementary to said antenna portion for affixing said antenna portion to a structure; and,

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a radome for protecting said antenna portion from weather.

40. The kit of parts according to claim 39 wherein said connecting means is wireless.

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41. The kit of parts according to claim 39 wherein said connecting means is wired.

42. The kit of parts according to claim 41 wherein said connecting means is a single piece of coaxial cable for carrying controls signals, power signals and transceived signals over a radio link, said antenna portion and said subscriber station further include means for differentiating said signals.

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